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PATENT APPLN. NO. 10/625,724  
SUBMISSION UNDER 37 C.F.R. § 1.114

PATENT

REMARKS

The Office has maintained the 35 U.S.C. § 102 rejections of the claims of the present application over Harada et al. (WO 99/65095) and Harada et al. (U.S. Patent No. 6,440,607) that was made in the fourth Office Action dated July 20, 2006. WO 99/65095 and U.S. Patent No. 6,440,607 are counterparts. Therefore, applicants will refer to these references collectively as "Harada".

Harada et al. discloses a nickel-hydrogen secondary battery comprising a positive electrode containing a nickel compound (e.g., nickel hydroxide); a negative electrode containing a hydrogen absorbing alloy which can contain aluminum, a binder and an electrically conductive material; a separator; and an electrolyte, wherein the binder contains a carboxylated styrene-butadiene copolymer latex.

Claim 1 of the present application, prior to the amendment made herein, recites a nickel metal hydride storage battery comprising a positive electrode comprising nickel hydroxide as an active material, a negative electrode comprising a hydrogen absorbing alloy containing aluminum, a separator and an alkaline electrolyte, wherein a complex-forming agent which forms a complex with aluminum is included in the negative electrode. Claim 2

recites that the complex-forming agent is an aromatic carboxylic acid.

The Office's position is that the carboxylated styrene-butadiene copolymer latex disclosed in Harada is a complex-forming agent which forms a complex with aluminum as recited in claim 1 of the present application because "the carboxylated styrene-butadiene copolymer binds together particles of the powder containing aluminum".

Applicants again respectfully submit that the position of the Office is not reasonable, when the claims are read in light of the specification. Although the Office is permitted to give claims their broadest reasonable interpretation, such interpretation must be consistent with the specification, see *In re American Academy of Science Tech Center*, 367 F.3d 1359, 1364 [70 USPQ2d 1827] (Fed. Cir. 2004); and *In re Bond*, 910 F.2d 831, 833 [15 USPQ2d 1566] (Fed. Cir. 1990). A compound that physically binds, or adheres, particles is not a "complex-forming agent" within the ordinary meaning of this terminology and as used in the present specification, e.g., a ligand that binds to a metal ion to form a complex (as evidenced by the attached definitions of "complexing agent"). Moreover, a carboxylated styrene-butadiene copolymer latex is not an "aromatic carboxylic acid" within the ordinary

meaning of this terminology and as used in the present specification.

In the event that the rejection of the claims over Harada is maintained, the Office is requested to explain:

(1) its interpretation of the terminology "complex-forming agent";

(2) why a carboxylated styrene-butadiene copolymer latex is a carboxylated styrene-butadiene copolymer latex is a complex-forming agent within the meaning of the present claims;

(3) its interpretation of the terminology "aromatic carboxylic acid"; and

(4) why a carboxylated styrene-butadiene copolymer latex is a carboxylated styrene-butadiene copolymer latex is an aromatic carboxylic acid within the meaning of the present claims.

Notwithstanding the impropriety of the Office's position, claim 1 has been amended to recite that the complex-forming agent forms a complex with aluminum ions. This amendment is supported *inter alia* by the description in paragraph [0010] of the specification of the present application. As noted in the Action, Harada teaches that the carboxylated styrene-butadiene copolymer latex binds together particles of the powder containing the hydrogen absorbing alloy. Nothing in Harada suggests that the

carboxylated styrene-butadiene copolymer latex forms a complex with aluminum ions in the nickel-hydrogen secondary cell disclosed therein. Moreover, applicants submit that a person of ordinary skill in the art would not reasonably expect the carboxylated styrene-butadiene copolymer latex of Harada to function as a complex-forming agent which forms a complex with aluminum ions because a carboxylated styrene-butadiene copolymer latex as disclosed in Harada is known to be a chemically stable rubber compound.

Removal of the rejections of the claims is believed to be in order and is respectfully requested.

The foregoing is believed to be a complete and proper response to the Office Action dated January 16, 2007, and is believed to place this application in condition for allowance. If, however, minor issues remain that can be resolved by means of a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number indicated below.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of

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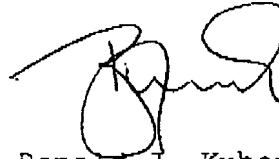
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time. The fee for any such extension may be charged to our Deposit Account No. 111833.

In the event any additional fees are required, please also charge our Deposit Account No. 111833.

Respectfully submitted,

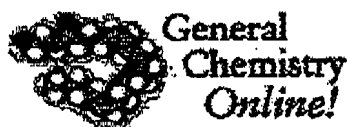
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Attachment: Definitions of "complexing agent"



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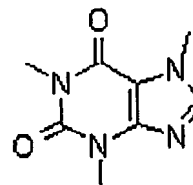
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[Tutorial Index](#)





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**caffeine.**  ( $C_8H_{10}N_4O_2$ ) methyltheobromine; guaranine; 1,3,7-trimethylxanthine; 1,3,7-trimethyl-2,6-dioxopurine. A substance found in tea, coffee, and cola that acts as a stimulant. It is extremely soluble in supercritical fluid carbon dioxide and somewhat soluble in water; aqueous solutions of caffeine quickly break down.





**calibration.**

 Calibration is correcting a measuring instrument by measuring values whose true values are known. Calibration minimizes systematic error.

**calorie.**  The amount of heat required to raise the temperature of 1 g of water at 14.5°C to 15.5°C. One calorie is equivalent to exactly 4.184 J.

**calorimeter.**  An insulated vessel for measuring the amount of heat absorbed or released by a chemical or physical change.

**calorimetry.**  Experimental determination of heat absorbed or released by a chemical or physical change.

**calutron.**  A device that separates isotopes (e. g.  $^{235}\text{U}$  from  $^{238}\text{U}$ ) by ionizing the sample, accelerating the ions in a strong electric field, and then passing them through a strong magnetic field. The magnetic field bends the trajectories of the ions with high charge-to-mass ratio more, allowing ions to be separated by mass and collected.

**capacitor.** (A device for storing electric charge  $^{+}$ , consisting of two metal plates separated by an insulating material. )

**carbohydrate, carb.** A class of organic compounds  $^{+}$  including sugars and starches. The name comes from the fact that many (but not all) carbohydrates have empirical formula  $^{+}$   $\text{CH}_2\text{O}$ .


**carbon.** C. An element  $^{+}$  with atomic number  $^{+}$  6. Carbon is a nonmetal  $^{+}$  found in all organic compounds  $^{+}$ . Carbon occurs naturally as diamond  $^{+}$ , graphite  $^{+}$ , and buckminsterfullerene  $^{+}$ .

and an oxidizing agent<sup>±</sup> that produces heat (and usually, light). For example, the combustion of methane is represented as  $\text{CH}_4(\text{g}) + 2 \text{O}_2(\text{g}) = \text{CO}_2(\text{g}) + 2 \text{H}_2\text{O}(\ell)$ .

**complete combustion.** Compare with incomplete combustion<sup>±</sup>. A combustion<sup>±</sup> reaction that converts all of the fuel's carbon, hydrogen, sulfur, and nitrogen into carbon dioxide, water, sulfur dioxide, and  $\text{N}_2$  respectively.


**complete ionic equation.** total ionic equation. Compare with net ionic equation<sup>±</sup>. A balanced equation<sup>±</sup> that describes a reaction occurring in solution, in which all strong electrolytes<sup>±</sup> are written as dissociated ions<sup>±</sup>.

**complexing agent.** complexant. A ligand<sup>±</sup> that binds to a metal ion to form a complex.

**complexometric titration.**  chelometric titration. A titration<sup>±</sup> based on a reaction between a ligand<sup>±</sup> and a metal ion to form a complex. For example, free  $\text{Ca}^{2+}$  in milk powder can be determined by titrating a milk powder sample with EDTA<sup>±</sup> solution, which chelates<sup>±</sup> calcium ion. Endpoints<sup>±</sup> in complexometric titrations are often determined using organochromic indicators<sup>±</sup>.

**complex ion.** An ion formed by combination of simpler ions or molecules; for example,  $\text{Co}^{2+}$  combines with six molecules of water to form the complex ion  $\text{Co}(\text{H}_2\text{O})_6^{2+}$ .

**component.** 1. A substance whose concentration<sup>±</sup> must be specified to describe the state<sup>±</sup> of a mixture in which reactions are occurring. 2. A substance present in a mixture in which no reactions occur.

**compound**  Compare with element<sup>±</sup> and mixture<sup>±</sup>. A compound is a material formed from elements chemically combined in definite proportions by mass. For example, water is formed from chemically bound hydrogen and oxygen. Any pure water sample contains 2 g of hydrogen for every 16 g of oxygen.

**computer-assisted drug design.** Using computational chemistry<sup>±</sup> to discover, enhance, or study drugs<sup>±</sup> and related biologically active molecules.

**computational chemistry.** A branch of chemistry concerned with the prediction or simulation of chemical properties, structures, or processes using numerical techniques.

**concentrate.** Compare with dilute<sup>±</sup>. To increase the amount of



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## complexing agent



**Definition:** A substance capable of forming a complex compound with another material in solution. (Source: MGH)

**Organization:** [European Environment Agency \(EEA\)](#), [European Topic Centre on Catalogue of Data Sources \(ETC/CDS\)](#)

**Information Source:** [General Multilingual Environmental Thesaurus \(Thesaurus\)](#)

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Web

Definitions of **complexing agent** on the Web:

- A compound that will combine with metallic ions to form soluble ions. See complex ion.  
[www.wmrc.uiuc.edu/main\\_sections/info\\_services/library\\_docs/manuals/finishing/appxa1.htm](http://www.wmrc.uiuc.edu/main_sections/info_services/library_docs/manuals/finishing/appxa1.htm)
- A dissolved ligand that binds with a simple charged or uncharged molecular species in a liquid solution to form a complex, or coordination compound.  
[www.fbi.gov/NABIR/fieldresearch/frc/ea/ea\\_12\\_0.html](http://www.fbi.gov/NABIR/fieldresearch/frc/ea/ea_12_0.html)
- Family of molecules that can form several bonds to a metal ion, in order to deactivate them. These additives can be used to improve polymer stability particularly for parts in contact with metal (such as Cables). Examples of chelating agents are: EDTA, ethylenediamine, phosphite.  
[www.specialchem4polymers.com/resources/glossary/index.aspx](http://www.specialchem4polymers.com/resources/glossary/index.aspx)
- Chelation (from Greek χηλή, chelè, meaning claw) is the process of reversible binding of a ligand, the chelator or chelating agent, to a metal ion, forming a metal complex, the chelate. The ligand does not have to be organic. In contrast to the simple monodentate ligands like H<sub>2</sub>O or NH<sub>3</sub>, which are easily broken apart by other chemical processes, the polydentate chelators form multiple bonds with the metal ion, resulting in more stable complexes. ...  
[en.wikipedia.org/wiki/Complexing\\_agent](http://en.wikipedia.org/wiki/Complexing_agent)

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